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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DONALD W. VERSER,
DAVID H. BURNS, and
JOHN D. HOTTOVY

Appeal 2008-6064
Application 10/699,095
Technology Center 1700

Decided:¹ March 24, 2009

Before CHARLES F. WARREN, CATHERINE Q. TIMM, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

I. STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1, 15, 28-31, 33, and 36-42. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The invention relates to a process for producing solid polymer particles. Claim 28 is illustrative:

28. A process, comprising:

polymerization at least one monomer in a reactor to produce a slurry comprising solid polymer particles and a liquid;

withdrawing substantially continuously via a valve a discharge slurry from the reactor, the discharge slurry comprising withdrawn solid polymer particles and withdrawn liquid, wherein the discharge slurry has a solids concentration greater than the solids concentration of the slurry in the reactor;

modulating the valve to adjust a flow rate of the discharge slurry to facilitate control of a pressure in the reactor;

passing the discharge slurry from the reactor through a heated conduit to vaporize at least a majority of the liquid in the discharge slurry; and

separating vapor from the heated discharge slurry via centrifugal forces.

The Examiner maintains that the claims are unpatentable as obvious and Appellants request review of the Examiner's rejections. The rejections are as follows:

A. Claims 1, 15, 28-31, 33, and 36-42 rejected under 35 U.S.C. § 103(a) as unpatentable over Kendrick (US 6,204,344 B1, issued Mar. 20, 2001) in view of Hanson '892 (US 5,597,892, issued Jan. 28, 1997); and

B. Claims 1, 15, 28-31, 33, and 36-42 rejected under 35 U.S.C. § 103(a) as unpatentable over Tormaschy (EP 0 432 555 A2, pub. Jun. 19, 1991) in view of respectively Hanson '892 and Hanson '341 (US 4,424,341, issued Jan. 3, 1984).

II. OBVIOUSNESS OVER KENDRICK AND HANSON '892

Dispositive Issue

Rather than directing us to any error regarding the Examiner's application of the teachings of the references or their combinability for showing obviousness, Appellants contend that Kendrick is not prior art because the claims of Appellants' present application have an earlier effective filing date than the Kendrick patent (Br. 6). In this regard, Appellants rely upon the disclosure of Hottovy, U.S. Patent No. 6,239,235 to establish that the parent application (Serial No. 08/893,200, which matured into US 6,239,235) fully supports the subject matter of the present claims. The support, according to Appellants, arises both from the written description within Hottovy and from the written description within Hanson '341 which is incorporated by reference in Hottovy (Br. 6-7).

The Examiner responds that Hottovy does not provide written descriptive support for "solid polymer" because support is limited to *olefin* solid polymer, does not provide support for "separating the vapor from the intermediate product by centrifugal force in a cyclone" as recited in claim 1,

and does not provide support for “separating vapor from the heated discharge slurry via centrifugal forces” as recited in claim 28 (Ans. 7-8).²

If the parent application to Hottovy supports the presently pending claims, Kendrick is not “prior art” and cannot be used as evidence to reject the claims. Therefore, the dispositive issue on appeal arising from the contentions of Appellants and the Examiner is: Are the present claims fully supported by the Hottovy parent application (now US 6,239,235) and the material incorporated by reference in Hottovy such that the application has an effective filing date of May 29, 2001 thereby excluding Kendrick as prior art? Specifically,

- I. Does the parent Hottovy provide support for producing “solid polymer” particles as recited in claims 1, 28, and 37?
- II. Does the parent Hottovy provide support for separating by centrifugal force as required by claims 1, 28, and 41?

Because Appellants do not argue any of the dependent claims apart from the independent claims from which they depend, we select the independent claims (claims 1, 28, and 37) as representative for deciding the issues on appeal. We also select claim 41 for review.

In considering the question of whether Hottovy provides support, we cite to the columns and lines of the issued Hottovy patent. We do so because both Appellants and the Examiner cite to the issued patent, the issued patent is readily available electronically while the originally filed application is not, and we determine that the relevant portions of the originally filed application are materially the same as those in the patent

² The Answer refers to “claim 8,” but there is no claim 8 pending, and the quoted language is found in claim 28.

document. One paragraph, which is located in the patent at column 5, lines 49-65, was inserted during prosecution of the Hottovy application. We, therefore, do not consider the disclosure within this paragraph in our analysis. Nor do we consider the amendments to the claims.

Principles of Law

During examination, "claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

"[A] patent application is entitled to the benefit of the filing date of an earlier filed application only if the disclosure of the earlier application provides support for the claims of the later application, as required by 35 U.S.C. § 112." *Power Oasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008).

In establishing a basis for finding lack of support under 35 U.S.C. § 112, ¶ 1, the Examiner has the initial burden of presenting evidence of reasons why persons skilled in the art would not recognize in the earlier disclosure a description of the invention defined by the claims. *In re Wertheim*, 541 F.2d 257, 263 (CCPA 1976). However, the burden is met when the Examiner points out that the claim reads on embodiments outside the scope of the original written description. *Id.*

On the other hand, when the original written description describes something within the scope of the claim, the Examiner must do more than point out the difference in scope. This is so because "that a claim may be broader than the specific embodiment disclosed in a specification is in itself

of no moment.” *In re Rasmussen*, 650 F.2d 1212, 1215 (CCPA 1981). There are instances in which a narrower disclosure can support broader claims. *Id.* (finding “adheringly applying” supported by specification only discussing adhesive application because “one skilled in the art who read Rasmussen’s specification would understand that it is unimportant how the layers are adhered, so long as they are adhered.”); *see also In re Smythe*, 480 F.2d 1376, 1382 (CCPA 1973) (Claims reciting “inert fluid” supported by specification disclosing only air or other gas because it was the characteristics of a fluid that made the segmentizing medium work in the invention).

This is not to say that a species always constitutes a description of the genus of which it is part, it is only to say that an examiner must consider the specific facts of the case and provide supporting reasoning. *Smythe*, 480 F.2d at 1382. The Examiner must provide some analysis that either: (1) considers factors such as the knowledge of one skilled in the art and the level of predictability in the field, *Bilstad v. Wakalopulos*, 386 F.3d 1116, 1124 (Fed. Cir. 2004), or (2) demonstrates that the specification reflects that the invention is no broader than what is disclosed in the specification. *See Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1159 (Fed. Cir. 1998) (specification, by distinguishing prior art cup implant shapes as inferior and touting the advantage of a conical shape, made clear that the invention was limited to conical shaped cups and nothing broader); *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998) (original disclosure that clearly identified the console as the only possible location for controls did not provide support for claims that did not limit the location).

“Incorporation by reference ‘provides a method for integrating material from various documents into a host document ... by citing such material in a manner that makes clear that the material is effectively part of the host document as if it were explicitly contained therein.’” *Zenon Environmental Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1378 (Fed. Cir. 2007) (quoting *Cook Biotech Inc. v. Acell, Inc.*, 460 F.3d 1365, 1376 (Fed.Cir.2006) (quoting *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000)). “To incorporate material by reference, the host document must identify with *detailed particularity* what specific material it incorporates and *clearly indicate where* that material is found in the various documents.” *Id.* “Whether material has been incorporated by reference into a host document, and the extent to which it has been incorporated, is a question of law.” *Id.* “In making that determination, the standard of one reasonably skilled in the art should be used to determine whether the host document describes the material to be incorporated by reference with sufficient particularity.” *Id.*, at 1378-79.

Findings of Fact – Issue 1

The following enumerated findings of fact (“FF”) are of particular relevance to the question of whether Hottovy supports claims directed to producing solid polymer particles in general or whether the claims must be limited to producing olefin polymer particles:

1. The Examiner states that “Hottovy’s polymerization process is limited to olefin polymer preparation only rather than the unspecified ‘solid polymer’ of the instant claims.” (Ans. 7.)
2. The Examiner does not provide evidence or technical reasons why the disclosure in Hottovy of polymerizing to form olefin polymer

particles does not support a claim to the genus of polymerizing solid polymer particles (Ans. in its entirety.)

Analysis – Issue I

There is no question here that the Specification describes preparation of olefin solid polymer particles (FF 1). There is also no question that olefin solid polymer particles are within the scope of the “solid polymer particles” of the claims (FF 1). Because the claim encompasses embodiments disclosed in the Specification, it was incumbent on the Examiner to provide technical reasons and/or evidence supporting a finding of lack of written descriptive support. *See Gentry Gallery*, 134 F.3d at 1479 (“a claim need not be limited to a preferred embodiment”); *Bilstad*, 386 F.3d at 1124-25 (disclosure of a species may be sufficient written descriptive support for a later claimed genus including that species.). Such reasoning and/or evidence is lacking in the present rejection (FF 2).

Conclusion

The Examiner has not established that the parent application to Hottovy fails to provide written descriptive support for producing “solid polymer” particles as recited in claims 1, 28, and 37.

Findings of Fact – Issue II

The following enumerated findings of fact (“FF”) are of particular relevance to the question of whether Hottovy supports claims directed to processes with steps of “separating the vapor from the intermediate product by centrifugal force in a cyclone” as recited in claim 1, and “separating vapor from the heated discharge slurry via centrifugal forces” as recited in claim 28:

1. Claim 1 requires a step of “separating the vapor from the concentrated intermediate product by centrifugal force in a cyclone.” The “concentrated intermediate product” is the non-vaporized product of the heated conduit, i.e., the flashline (*see* the passing step of claim 1).
2. Figure 11 of the continuation-in-part (CIP) Specification (Specification of the current application) illustrates this “direct” separation. The product of flashline conduit 36 is directly separated in funnel 66 (Fig. 11).
3. Figure 11 is reproduced below:

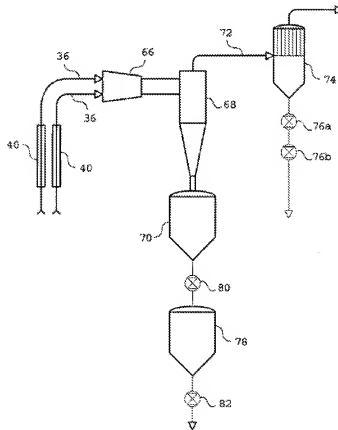


Figure 11 is a view of a downstream recovery system in which flashline 36 directly discharges to a funnel 66 (Spec. ¶¶ [20], [36], and [55]).

4. The current CIP Specification states that “the flashlines heater may discharge to a ‘funnel’ 66 and/or a cyclone 68 as shown in FIG. 11.”
5. The CIP Specification discloses, alternatively, “the flashlines 36 may discharge to a high pressure flash chamber 38, as shown in FIG. 1.” (Spec. ¶ [55].)
6. Figure 1 of the CIP, which is the same as Figure 1 of Hottovy is reproduced below:

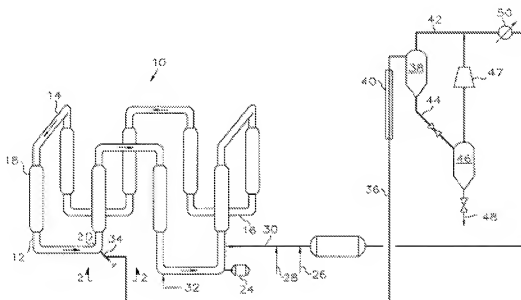


FIG. 1 is a schematic perspective view of a loop reactor and polymer recovery system.

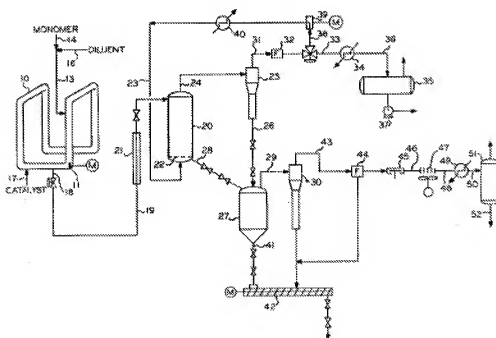
7. Figure 1 shows a loop reactor 10 in which monomer is polymerized (Hottovy, col. 3, l. 65). The Intermediate product slurry is removed from the reactor through continuous take off mechanism 34 (col. 4, ll. 13-18).
8. According to Hottovy,

The continuously withdrawn intermediate product slurry is passed via conduit 36 into a high pressure flash chamber 38. Conduit 36 includes a surrounding conduit 40 which is

provided with a heated fluid which provides indirect heating to the slurry material in flash line conduit 36. Vaporized diluent exits the flash chamber 38 via conduit 42 for further processing which includes condensation by simple heat exchange using recycle condenser 50, and return to the system, without the necessity for compression, via recycle diluent line 30. . . . Polymer particles are withdrawn from high pressure flash chamber 38 via line 44 for further processing using techniques known in the art. Preferably they are passed to low pressure flash chamber 46 and thereafter recovered as polymer product via line 48. Separated diluent passes through compressor 47 to line 42. This high pressure flash design is broadly disclosed in Hanson and Sherk, U.S. Pat. No. 4,424,341 (Jan. 3, 1984), the disclosure of which is hereby incorporated by reference.

(col. 4, ll. 32-54.)

9. The Figure of Hanson is reproduced below:



The Figure is a schematic diagram illustrating a high pressure separation process.

10. Hanson '341 describes a high pressure flash design with two flash chambers, a higher pressure chamber 20 and a lower pressure chamber 27.
11. Hanson describes cyclones 25 and 30 which receive vaporized diluent from the flash chambers and separate entrained polymer particles from the vapor (Hanson '341, col. 3, ll. 5-25). Some of the vapor from the high pressure chamber is recycled back into the chamber (Hanson '341, col. 3, ll. 41-44).
12. The written description of Hottovy discloses producing a concentrated intermediate product and vapor in the flashline conduit 36, and separating the vapor from the concentrated intermediate product in flash chamber 38.
13. Hanson '341 describes producing concentrated intermediate product and vapor in flashline 19, and separating the vapor from the concentrated intermediate product in flash chamber 20 and separating entrained polymer from the resulting vapor in cyclone 25. The cyclone 25 may be present within the flash chamber rather than connected to it by a conduit (Hanson '341, col. 4, ll. 9-12).

Analysis

The parent application to Hottovy states that “[t]his high pressure flash design is broadly disclosed in Hanson and Sherk, U.S. Pat. No. 4,424,341 (Jan. 3, 1984), the disclosure of which is hereby incorporated by reference” (FF 3). One reasonably skilled in the art of solid polymer particle separation from slurry would understand Hottovy as incorporating Hanson '341's disclosure of using two flash vessels, one at higher pressure, and one at lower pressure, in Hottovy's invention. Given that Figure 1 of Hottovy,

and the paragraph within Hottovy describing the separation apparatus provides significant details of the separation apparatus without disclosing the use of separation by centrifugal force or cyclone (FF 6 and 8), we cannot agree with Appellants that centrifugal separation is identified with sufficient particularity such that it is shown to be effectively part of the host document, i.e., Hottovy. We determine that the current Specification does not reasonably convey to one of ordinary skill in the art that Appellants were in possession of the separation apparatus of Hanson '341 as a whole within the continuous withdrawal process of Hottovy.

Even if Hottovy had identified the cyclone separators of Hanson '341 as incorporated by reference, we still could not agree with Appellants that the disclosure reasonably conveys Appellants had possession of what is claimed in claims 1, 28, and 41.

The step of "separating the vapor from the concentrated intermediate product by centrifugal force in a cyclone" required by claim 1 is directed to the new embodiment of Figure 11, i.e., the embodiment of discharging the product of the flashline directly into a funnel or cyclone (FF 1-4).

Hanson '341's cyclones separate entrained polymer from a vapor stream leaving a flash chamber. The cyclones do not separate vapor from "the concentrated intermediate product," i.e., the product leaving the flashline conduit. This is the case whether the cyclone is present in the flash chamber or connected to it by a conduit. In either case, the cyclone separates entrained polymer from a vapor steam originating in the flash chamber. In other words, the concentrated intermediate product stream is separated within the flash chamber before the resulting vapor stream and polymer particles stream are separately processed in additional separation

operations (vapor stream separated in cyclone 25 and polymer stream separated in flash chamber 27).

Turning to claim 28, this claim requires “separating vapor from the heated discharge slurry via centrifugal forces.” Again, neither Hottovy nor Hanson ‘341 describes using centrifugal forces to separate these two streams. Hottovy alone clearly only describes using a flash chamber. There is no disclosure that separation in the flash chamber uses centrifugal forces. In the process of Hanson ‘341, the heated discharge slurry from conduit 19 is first separated into a vapor stream and a polymer stream in chamber 20. It is the vapor stream from the flash chamber 20 that undergoes further separation in cyclone 25, not the “heated discharge slurry” stream.

Turning to claim 37, this claim is not limited to separating in a cyclone or to using centrifugal force. However, claim 41, which is dependent on claim 37, requires that the separator be a cyclone and that the cyclone separate vapor from the “heated discharge slurry.” Hanson ‘341 discloses separating entrained polymer from a vapor stream, not separating vapor from a “heated discharge slurry.”

Conclusion

Claim 37 is supported and therefore, Kendrick is not prior art with respect to this claim. Appellants have shown the Examiner reversibly erred in rejecting claims 37-40, and 42.

Claims 1, 28, and 41 are not supported by parent Hottovy, and, therefore, these claims do not gain the benefit of the effective filing date of Hottovy. Kendrick is prior art with respect to these claims. Appellants do not dispute the Examiner’s determination that the combination of Kendrick and Hanson ‘341 render the claimed subject matter obvious within the

meaning of 35 U.S.C. § 103(a). As Appellants have not shown reversible error on the part of the Examiner, we sustain the rejection as to these claims.

III. OBVIOUSNESS OVER TORMASCHY, HANSON '892, AND HANSON '341

Dispositive Issue

Appellants note that all the independent claims (claims 1, 28, and 37) require continuous withdrawal of slurry from the loop reaction zone. Appellants contend that, contrary to the finding of the Examiner, Tormaschy is completely silent with regard to the claimed continuous withdrawal (Br. 15-16). Appellants also rely upon the Hottovy Declaration as further evidence that Tormaschy does not disclose or even contemplate continuous withdrawal (Br. 16).

Focusing on claims 28 and 37, Appellants further contend that Tormaschy does not teach: (1) regulating continuous discharge to control pressure in the reactor while maintaining generally constant the diluent feed rate to the loop reactor in steady-state; (2) a discharge valve; and (3) continuously withdrawing a slurry having an increase in solids concentration as compared with the slurry in the reactor (Br. 17-18).

With respect to continuous withdrawal, the Examiner finds that given the conditions recited in Tormaschy, one of ordinary skill in the art would have recognized that polymerization in these conditions is defined as a continuous process (Ans. 8).

With respect to the limitations of claims 28 and 37, the Examiner finds that: (1) the absence of the valve in the product withdrawal line 23 in Figure 1 of Tormaschy only confirms that withdrawal is continuous (Ans.

8); and (2) the Figure of Hanson '892 and Figure 1 of Hanson '341 withdraw slurry from the bottom of the reactor, an area inherently containing higher concentrations of solids due to gravity, and, therefore, one would have expected such a feature to also exist in all of the cited references (Ans. 9).

We select claim 1, 28, and 37 as representative for the issue arising regarding continuous withdrawal. We select claims 28 and 37 as representative for the other arising issues. The issues are as follows:

- I. Have Appellants established that the Examiner reversibly erred in finding that Tormaschy teaches or would have suggested to one of ordinary skill in the art a loop reactor polymerization process including a step of “withdrawing substantially continuously a portion of the slurry” as required by claims 1, 28, and 37?
- II. Have Appellants established that the Examiner reversibly erred in concluding that the combination of Tormaschy with Hanson '341 or Hanson '892 would have suggested withdrawing the slurry via a valve, modulating the valve to adjust flow rate to facilitate pressure control in the reactor, or that the Examiner reversibly erred in finding that the withdrawn slurry inherently would have a solids concentration greater than the solids concentration within the reactor as required by claim 28 and 37?

Findings of Fact

14. Claims 1, 28 and 37 require withdrawal be “substantially” continuous.
15. The Specification indicates that withdrawal of the slurry from the reactor “may be in a batch fashion, such as by settling legs, or may be continuous, such as by using an elongated hollow appendage.” (Spec.

- ¶ [05].) Use of the settling leg illustrated in Hanson '341 is incorporated by reference (Spec. ¶ [32]).
16. The Specification describes a polymerization process in which solid polymer particles and liquid diluent are withdrawn by alternately carrying out the following steps: a) allowing the fluid slurry to settle into at least one settling zone and thereafter withdrawing a batch of the thus settled slurry from the settling zone, thereafter shutting off the valve at the bottom of the settling zone; and b) thereafter continuously withdrawing the fluid slurry (Spec. ¶ [41]).
17. The Specification does not provide guidance with regard to the meaning of withdrawing “substantially” continuously as recited in claims 1, 28, and 37.
18. Tormaschy is directed to a loop polymerization process and is mainly directed to optimizing the solids concentration in the reaction slurry (Tormaschy, p. 3, ll. 52-54).
19. On page 5, lines 24-52, Tormaschy describes circulating a reaction mixture in a loop-type reactor 11. Ethylene and diluent are supplied to the reactor. Catalyst is introduced periodically by use of catalyst feed valve 21. The polyethylene-containing reactor effluent is withdrawn from reactor 11 through conduit 23 and is passed to the flash tank 25. Diluent is supplied to control solids concentration in the reaction mixture.
20. At page 5, line 53, Tormaschy explains that:
- The polymerization reaction system described to this point is conventional. It is the manner in which the polymerization reaction system is operated and the manner in which the solids concentration is controlled so as to

achieve the highest practical solids concentration without plugging the reactor that provides the novel features of this invention. Further information and details of the polymerization process including examples of suitable reaction conditions, and also examples of other monomers, comonomers, diluents, etc., as well as suitable control schemes for other important variables, such as production rate, can be found in U.S. Patent No. 3,998,995 of Buss, et al. and U.S. Patent No. 3,257,363 of Miller, et al., the disclosures of which are incorporated herein by reference.

(Tormaschy, p. 5, l. 53 to p. 6, l. 2.)

21. US 3,257,363 to Miller is directed to polymerization in a loop reactor and explains that “[t]he effluent from the reactor 11 is withdrawn through a product conduit 19, which can be a drain or vertical leg,” and “[w]ithdrawal of the product can be continuous or intermittent.” (Miller, col. 2, ll. 52-59.)
22. Miller states that “[i]n the case of continuous withdrawal, changes in volumetric reactor input causes changes in valve opening in the product conduit to maintain constant reactor pressure.” (Miller, col. 2, ll. 59-62).
23. Tormaschy exemplifies a process in which, under steady state operating conditions, 1.675 lbs./hr. of ethylene, 16 lbs./hr. of hexane-1, and 916 lbs./hr. isobutene are fed into a reactor at a pressure of 600 psig along with 0.51 lbs./hr. catalyst. Polymer is withdrawn at a rate of 1,635 lbs./hr. along with 916 lbs./hr. of isobutene, 39 lbs./hr. ethylene, and 1.6 lbs./hr. of hexane-1. (Tormaschy, p. 7, ll. 45-50.)
24. The Hottovy Declaration states that John D. Hottovy was a co-inventor of record of EP 0 432 555, i.e., the Tormaschy reference (Hottovy Dec. ¶ 3).

25. Hottovy declares that

In European Patent 0 432 555, I and the other co-inventors did not teach or suggest the concept of a continuous withdrawal of slurry from the loop reactor, Instead, we contemplated a settling leg configuration, in which withdrawal of slurry from the loop reactor occurs in a discontinuous manner.”

(Hottovy Dec. ¶ 4.)

Principles of Law

It is well settled that the word “substantially” has numerous ordinary meanings. It can be a term of approximation or a term of magnitude with meaning varying from “significantly” or “considerably” to “largely” or “essentially.” *Deering Precision Instruments L.L.C. v. Vector Distribution Sys. Inc.*, 347 F.3d 1314, 1321 (Fed. Cir. 2003). When “substantially” is used as a word of degree, one must look to the Specification to determine a standard for measuring that degree. *See Seattle Box Co. v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984) (“When a word of degree is used the district court must determine whether the patent’s specification provides some standard for measuring that degree.”).

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007).

The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *See In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

In considering the teachings of a prior art reference, one must take into account the reference's incorporation by reference of another patent. *Ultradent Prods., Inc. v. Life-Like Cosmetics, Inc.*, 127 F.3d 1065, 1069 (Fed. Cir. 1997).

In assessing the probative value of declaratory evidence, one must consider the nature of the matter sought to be established as well as the strength of the opposing evidence. *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

In general, a limitation is inherent if it is the "natural result flowing from" the explicit disclosure of the prior art. *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1379 (Fed. Cir. 2003). Where patentability rests upon a property of the claimed material not disclosed within the art, the PTO has no reasonable method of determining whether there is, in fact, a patentable difference between the prior art materials and the claimed material. *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977). Therefore, where the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily possess the characteristics of his claimed product. *Id.*

Analysis

"Substantially continuous withdrawal" of Claims 1, 28, and 37

As a first matter, we consider the meaning of the word "substantially" in the phrase "withdrawing substantially continuously." The Specification does not provide any guidance on the meaning of "substantially continuously." According to the Specification, withdrawal can be in a batch fashion or may be continuous (FF 15). The Specification also discloses a

method of withdrawing a batch of settled slurry alternately with continuously withdrawing (FF 16). Giving the term “substantially” its broadest reasonable interpretation consistent with the Specification, we determine that “withdrawing substantially continuously” encompasses at least some batch removal along with continuous removal.

We agree with the Examiner that Tormaschy would have suggested to one of ordinary skill in the art withdrawing the slurry from the reactor “substantially continuously,” i.e., at least mostly continuously allowing for some batch removal. Tormaschy’s example, which is run under steady state operating conditions with equal rates of diluent entering and exiting the reactor (FF 23), would have suggested to one of ordinary skill in the art continuous withdrawal of the slurry. The rate of removal is given in pounds per hour (FF 23).

Moreover, Tormaschy is mainly concerned with solids concentration control and discloses that, in other regards, the system is operated in a conventional manner without providing details of the slurry withdrawal system (FF 18-20). Instead of providing those details, Tormaschy incorporates by reference the disclosure of two patents, one of which is Miller (FF 20). As the disclosure of Miller was incorporated by reference, it is part of the disclosure of Tormaschy and must be considered as part of the teachings of Tormaschy. *See Ultradent Prods., Inc. v. Life-Like Cosmetics, Inc.*, 127 F.3d at 1069 (district court erred in deciding an issue of anticipation by Munro because it did not fully consider the disclosure of Rosenthal, which had been incorporated by reference into Munro). Miller provides details with regard to withdrawal of slurry from the reactor and, in so doing, discloses that the withdrawal can be continuous or intermittent (FF

21). Tormaschy, therefore, clearly discloses to one of ordinary skill in the art continuous withdrawal or at least “substantially continuous” withdrawal as required by claims 1, 28, and 37.

Declarant Hottovy states that he co-invented the Tormaschy process, and that he and the other co-inventors of the Tormaschy process did not teach or suggest in Tormaschy the continuous withdrawal concept (FF 25). However, even if Hottovy and the other co-inventors did not recognize such a teaching, the evidence as a whole supports a conclusion that one of ordinary skill in the art would have recognized a disclosure of continuous withdrawal in Tormaschy, particularly when read in view of the information incorporated by reference.

We cannot say that the Appellants have shown that the Examiner reversibly erred in finding that Tormaschy teaches or suggests substantially continuously withdrawing a portion of the slurry as required by claims 1, 28, and 37.

“Valve Discharge” of Claims 28 and 37

With regard to claims 28 and 37, we agree with Appellants that Tormaschy fails to expressly disclose either a valve or modulating that valve to adjust a flow rate of the discharge slurry to facilitate control of a pressure in the reactor (Br. 17-18). However, as we stated above and as acknowledged by Appellants (Br. 16), Tormaschy does not include the details of the withdrawal apparatus. Instead, Tormaschy incorporates by reference to two patents, one of which is Miller, for such details. Miller teaches “changes in valve opening,” i.e. modulating a valve, “to maintain constant reactor pressure.” (FF 22.) We find that Tormaschy, through the incorporation of Miller, teaches the required valve and modulating of the

valve as required by claims 28 and 37. The evidence of record supports the Examiner's conclusion of obviousness in regard to the valve and modulation limitations.

We further agree with Appellants that Tormaschy fails to expressly teach or suggest that the withdrawn slurry is of higher solids concentration than the slurry in the reactor (Br. 18). However, the incorporated patent to Miller shows that the slurry is withdrawn from a product conduit 19, which can be a drain or vertical leg in the bottom of the reactor (FF 21; *see also* Fig. 1). The Examiner finds that "the slurry withdrawn from the outlet of the bottom of the reactor inherently contains [a] higher concentration of solid due to gravity." (Ans. 9.) This finding of inherency based on gravity is reasonable and it shifted the burden to Appellants to show that the prior art apparatus would not, in fact, result in the claimed higher solids content. *See Best*, 562 F.2d at 1255. Appellants do not contest the Examiner's finding of inherency, nor provide any evidence to rebut it (Br. 18).

Conclusion

Appellants have not established that the Examiner reversibly erred in finding that Tormaschy teaches or would have suggested to one of ordinary skill in the art a loop reactor polymerization process including a step of "withdrawing substantially continuously a portion of the slurry" as required by claims 1, 28, and 37.

Appellants have not established that the Examiner reversibly erred in concluding that the combination of Tormaschy with Hanson '341 or Hanson '892 would have suggested withdrawing the slurry via a valve, modulating the valve to adjust flow rate to facilitate pressure control in the reactor, or that the Examiner reversibly erred in finding that the withdrawn slurry

inherently would have a solids concentration greater than the solids concentration within the reactor as required by claims 28 and 37.

IV. CONCLUSION

Appellants have limited the scope of their arguments to the above issues and do not further contest the Examiner's rejection of the claims.

Therefore, we sustain the following rejections of the Examiner:

A. The rejection of claims 1, 15, 28-31, 33, 36, and 41 under 35 U.S.C. § 103(a) as unpatentable over Kendrick in view of Hanson '892; and

B. The rejection of claims 1, 15, 28-31, 33, and 36-42 under 35 U.S.C. § 103(a) as unpatentable over Tormaschy in view of respectively Hanson '892 and Hanson '341.

We do not sustain the following rejection: The rejection of claims 37-40, and 42 under 35 U.S.C. § 103(a) as unpatentable over Kendrick in view of Hanson '892.

V. DECISION

The decision of the Examiner is affirmed.

VI. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(v).

AFFIRMED

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